

Figure 1

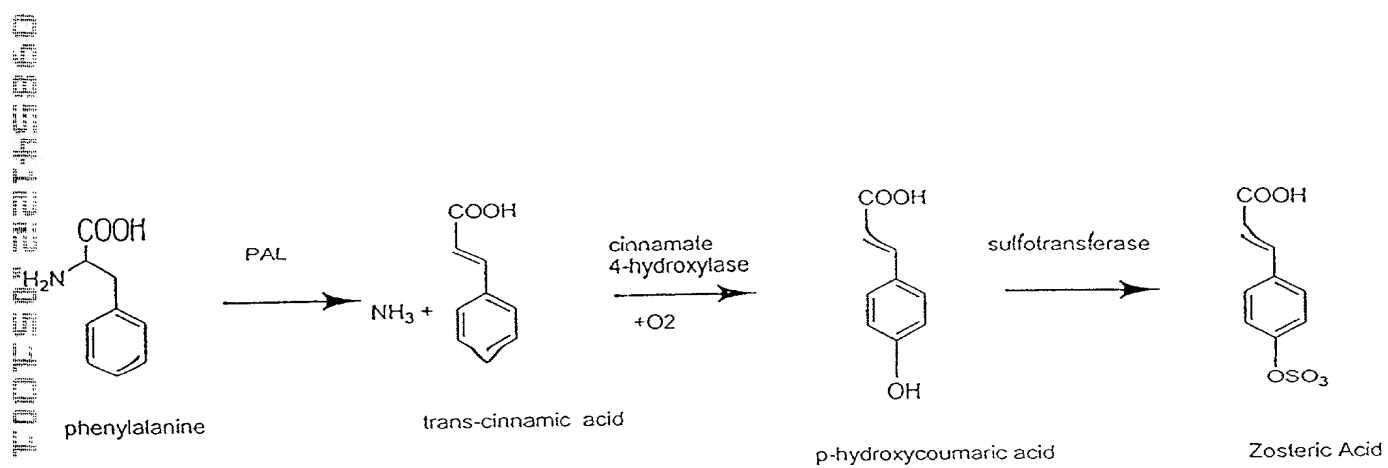


Figure 2

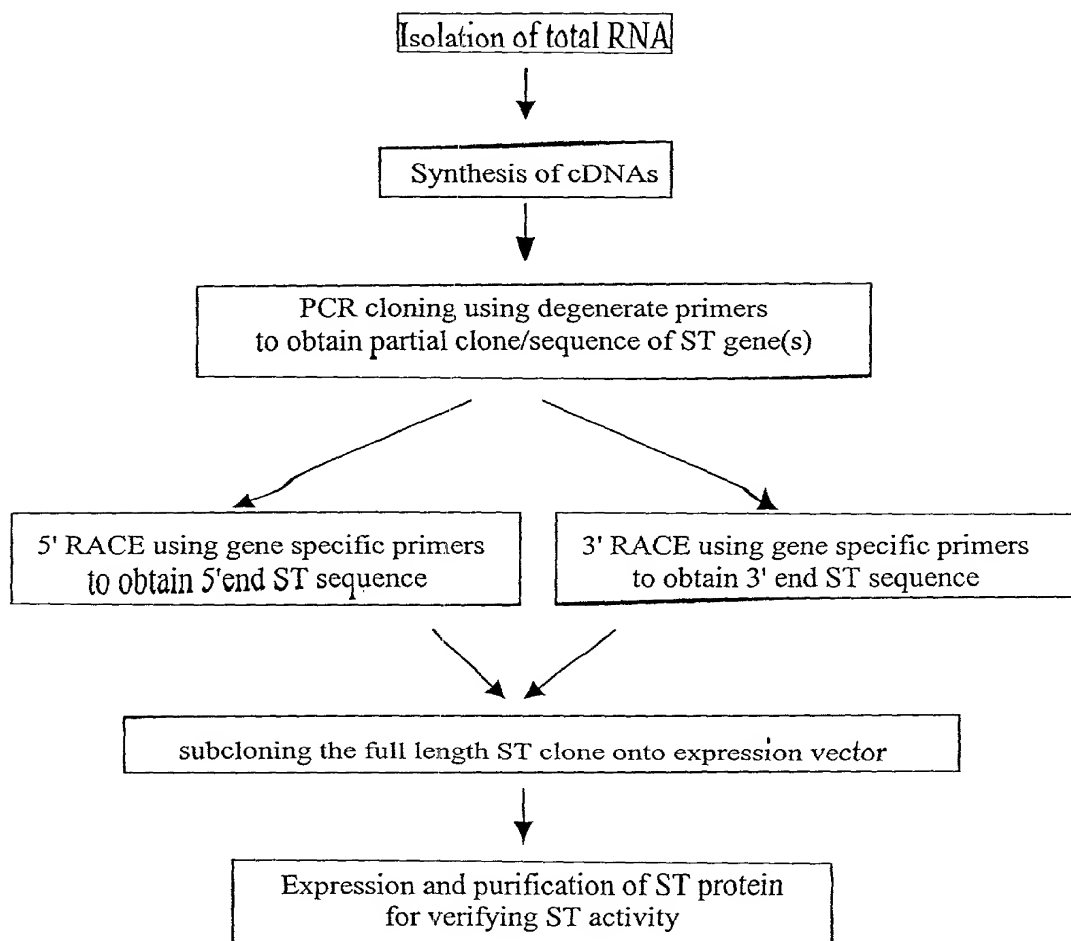


Figure 3

Primer name	Primer Sequence (from 5' to 3')	Protein sequence
Degenerate:		
Z-ST-P14 (5'primer)	TAYCCIAARAGYGGIACITGG	YPKSGTTW
Z-ST-P16 (3'primer)	YTTCCARTCICCHHHHCCYTTYCT	RKGXXGDWK
Z-ST-P17 (3'primer)	YTTCCARTCICCHHHHCCYTTIGC	RKGXXGDWK
Gene specific:		
Z-ST-P18 (5'primer)	ATCTGATTAACCCCGACAAGTTATTGG	
Z-ST-P19 (3'primer)	CCAATAACTTGTCGGGGTTAATCAGAT	
Z-ST-P26 (5'primer)	ATCCGAGCTCGATGGCTGGAATTTTAGC TTTGGAG	
Z-ST-P25 (3'primer)	CTAGAAGCTTACGAATGAATACGATAA TAAAC	

Figure 4

ACGCGGGAATAACTGGAATCGCTGTGCTGTAGCTACCACTGATAATGGCTGGAATTTAGCTTTGGAGAAATGTTTCGGATCCAAG 90
 T R G I T G I A V A C . L P L I M A G I L A L E K C F G S K
 AATGAGCAAGAGAAGGAAGATTCCAAAATGTACAAGAGATATAGAGAGATTGTTTCTTCACTTCCCTCGAATGATTATTGGGGGGAT 160
 N E Q E K E E D S K M Y K R Y R E I V S S L P S N D Y W G D
 ACCATGAGGTGTACAAGGGATTTGGCAAATGGGATATCTGTACCTGGTATCATGGCTTTGGAAGATAATTTCAAGGCTCGAGAGACG 270
 T M R L Y K G F W Q M G Y L V P G I H A F E D N F K A R E T
 GACATTATCCTTACGACTCTTCCAAAGGCTGGAACGACATGGACGAAGGCACTGACGTTTGCCATCCTAACACGAGATGTTAACCACCCA 360
 D I I L T T L P K A G T T W T K A L T F A I L T R D V N H P
 TCATCACCAGACATCCACTTTTGTCTTCAACCCTCATTGCTGTGTTCAAAATTTGGAGTATTGTACATGGGTAGAGAAAATACGATG 450
 S S P T H P L L F F N P H S C V Q N L E Y L Y M G R E N T M
 CCAGACCTCGATATGTTGAATGAATCGCCGAGGTGTTTGGCCGACACATCCCATACTCTTTGTTGCCGGCGTCTGTTTTGAAATCGGGA 540
 P D L D M L N E S P R L F A G H I P Y S L L P A S V L K S G
 ACAAAATCATCAATATAAGCCGCAACCGTAAGAGTACATTTGTGCTTTTGGAAATTTGGCAATCTGATTACCCCGACAAGTTATTG 630
 T K I I N I S R N R K S T F V S F W K F G N L I N P D K L L
 GACCTCGAAAAGAGCGTTGATATCTTCGCATCGGGAATCTCCTTTGTGGACCGGAATGGAATTTCCAAGCGGAGTTACCAATGCGGCG 720
 D L E K S V D I F A S G I S F C G P E W N F Q A E F T N A A
 TCTACTAATTCAAACCTTGCTATTGTTGAGTTACGAAGAAATGTTAGAGAAGCCAGTTGAAAATGTGAAGAAGCTAGCTGAGTTTCATGGGA 810
 S T N S N L L L L S Y E E M L E K P V E N V K K L A E F M G
 TGTGGGTTACAGACGATGAGGAGAAACAAGGGATTGTTGATGAGATAGTTAAACTTTGTAGCTTCGACAATCTGAAGAATCAACAGGTG 900
 C G F T D D E E K Q G I V D E I V K L C S F D N L K N Q Q V
 AACAAAAACGGATCAAGCTACAATTCGAAAATCGACAACAAGCATTCTTCAGGAAAGGTGAGGTGAGAGATTGGGCAAACTATCTAACG 990
 N K N G S S Y N S K I D N K H F F R K G E V R D W A N Y L T
 TCGGAAATGATTAAGAACTGGAGACGGCCGAAAAATAAATGAATCAGAGTAAAAGCATTATTATCGTGAAATAAGAATCTTACATGA 1080
 S E M I K K L E T A G K I N E S E . K H L L S . N K N L T .
 AACTTCGAAATCTTAATAATTACTGTGAGAAATCGAACTAAATATCTCTTTGTTTATTATCGTATTCATTGTAATAAATAATTTTATT 1170
 N F . N L N N Y C E K S N . I S L C L L S Y S F V I N N F I
 TTGTTAAAAA 1192
 L L K K K K K

09854433 05 4004

Figure 5

<i>Z. marina</i>	MAGILALEKCFG	SKNEOEKEE	DSKMY	KRYREIV	SSLPS	NDYW	-	GDTMR	LYK	GEW	QMGYLV	59
<i>B. napus</i>	MSS-----	SSSVDP	YLROEN	LTQKT	KDLISS	LPSE	KGWL	VCOM	YQF	QGR	WHTQ	ALL 51
<i>A. thaliana</i>	MSS-----	SSSVPA	YLGDED	LTQET	RALISS	LPSE	KGWL	VSEI	YEF	QGL	WHTQ	AIL 51
<i>F. bidentis</i>	MET-----	TKT--	QFESMA	EHKK	LPQHT	CS--	SLKGR	IT--	LYKY	QDF	WGLQ	NNI 45
<i>H. sapiens</i>	MELIOD----	TSRPP	LEV	VKGVP	PIKY	FAEAL	GPL--	-----	-----	-----	-----	31
I												
<i>Z. marina</i>	PGIMAFEDN	FKARET	DIILT	TLPKAG	TTWTK	ALT	FAL	TRD	-	VNH	PS	118
<i>B. napus</i>	QGILTCQKH	FCAKDS	DIILV	TNPKSG	TTWLK	ALV	FAL	INRH	KFP	VYS	SV--	109
<i>A. thaliana</i>	QGILTCQKH	FCAKDS	DIILV	TNPKSG	TTWLK	ALV	FAL	INRH	KFP	VYS	SV--	111
<i>F. bidentis</i>	EGAILAQ	QSTKARP	DDVFL	CSY	PKSG	TTW	KAL	AYAL	VTR	EK	DEFTS	102
<i>H. sapiens</i>	-----	OSPOAR	PD	DL	LIN	TY	PKSG	TTW	V	SQ	ILD	77
II												
<i>Z. marina</i>	CVQNLE	YLYM	GRENT	MPDL	MLN	-	ESPR	IFAG	HIP	YSI	LFA	177
<i>B. napus</i>	LVPFL	GRSL	LL---	RS	PDF	DFS	OLS	SPR	LMN	TH	SHLS	165
<i>A. thaliana</i>	LVPFL	GRSL	LL---	RS	PDF	DFS	OLS	SPR	LMN	TH	SHLS	167
<i>F. bidentis</i>	CIPYIE	KDLK	---	K	IVEN	QNN	SC	FTP	-	MATH	MPY	156
<i>H. sapiens</i>	RVPFL	VND	PGEPS	GLET	LK--	-	D	T	P	P	RLI	135
III												
<i>Z. marina</i>	FVSFWK	FCN	LIN	PD	DKLL	D--	L	SK	S	V	D	234
<i>B. napus</i>	FVSLW	HFG	KKLA	PEET	ADY	P	IE	K	A	V	E	225
<i>A. thaliana</i>	FVSLW	HFG	KKLA	PEET	ADY	P	IE	K	A	V	E	227
<i>F. bidentis</i>	IVSFY	HFG	REIT	KLP	LED	AD	P	E	E	A	F	216
<i>H. sapiens</i>	AVSY	YH	-	H	R	M	E	K	A	H	P	192
IV												
<i>Z. marina</i>	YEEHLE	K	E	V	ENV	K	K	L	A	E	F	292
<i>B. napus</i>	YEEHLE	K	E	V	ENV	K	K	L	A	E	F	279
<i>A. thaliana</i>	YEEHLE	K	E	V	ENV	K	K	L	A	E	F	281
<i>F. bidentis</i>	YEDV	K	K	D	F	T	S	N	V	K	R	276
<i>H. sapiens</i>	YEDM	K	K	E	N	B	K	R	E	I	K	247
V												
<i>Z. marina</i>	SKID	NKH	FFR	KGE	V	R	D	W	A	N	Y	331
<i>B. napus</i>	G-MET	R	A	F	F	R	K	G	E	V	G	324
<i>A. thaliana</i>	G-IET	K	T	F	F	R	K	G	E	V	G	302
<i>F. bidentis</i>	P-IEN	R	L	Y	F	R	K	A	K	D	G	320
<i>H. sapiens</i>	MDHS	I	S	P	F	M	R	K	G	M	A	295

Figure 6

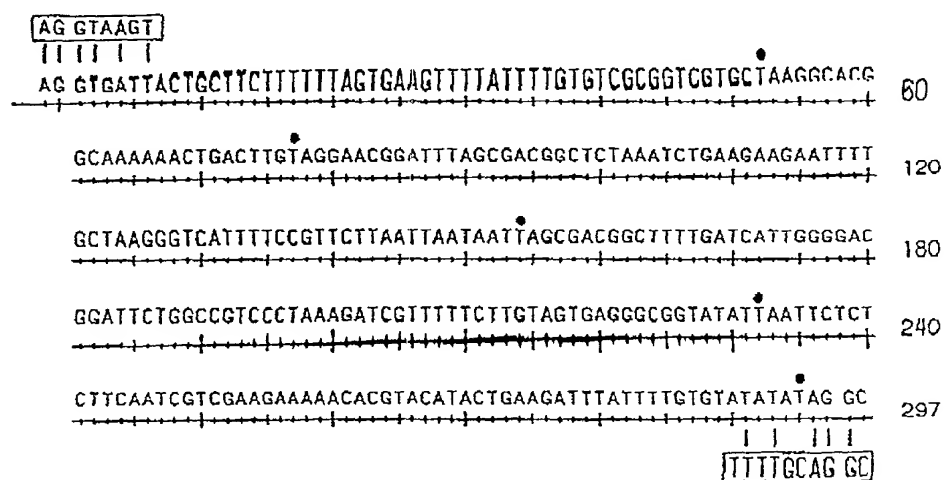
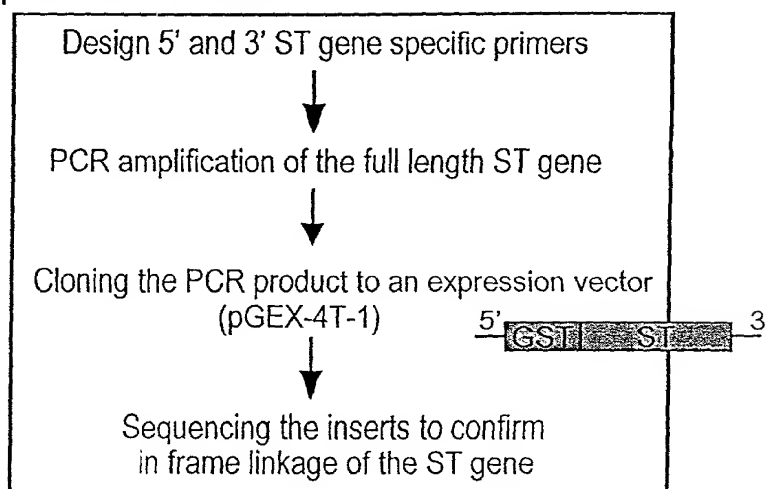
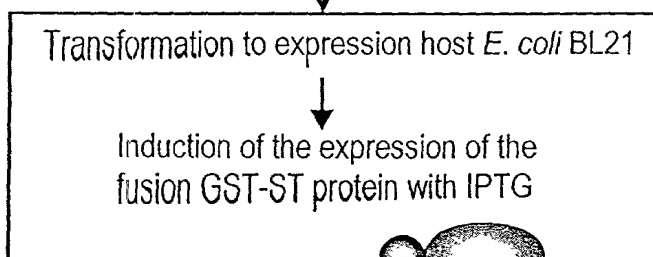


Figure 7

Subcloning of full-length ST
gene onto expression vector:



Expression of
ST fusion protein:



Determination of
enzymic activity:

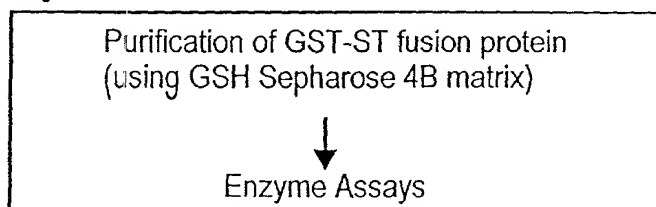


Figure 8

ST catalyzed sulfur transference:

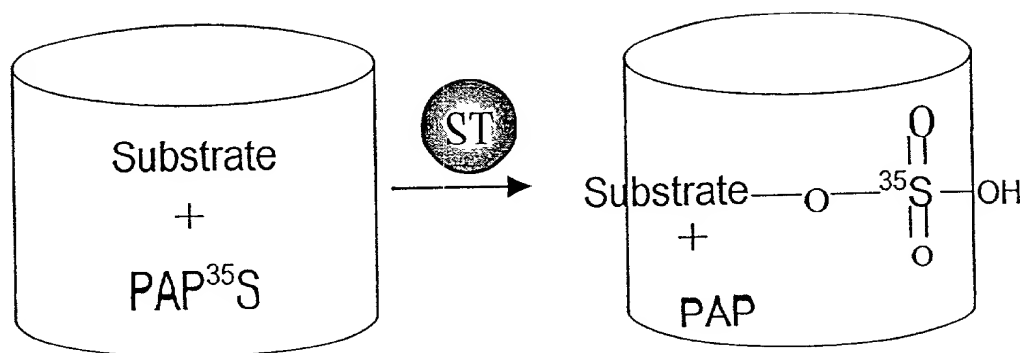


Figure 9

ST catalyzed sulfur transferation:

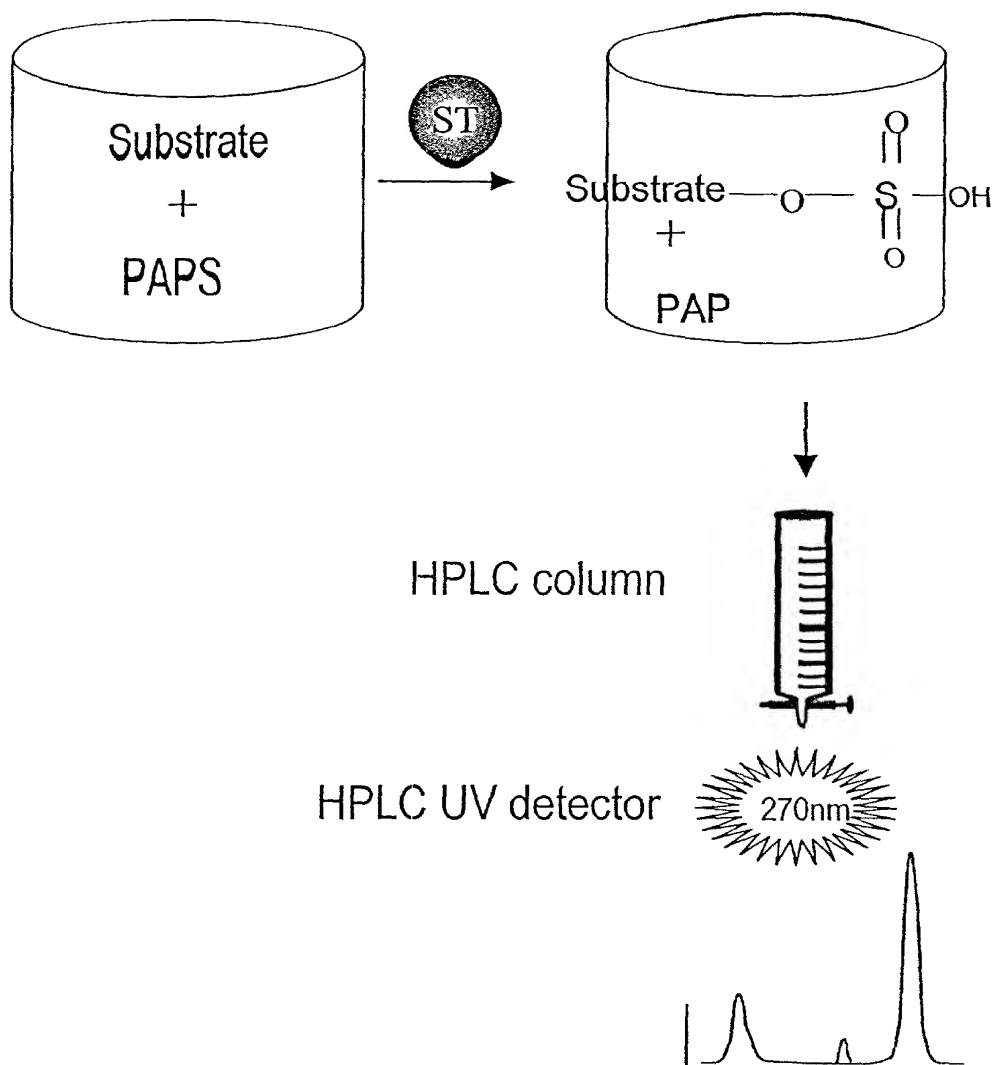


Figure 10

Substrate	Sp. Enzyme Activity (nmol/min/mg)		
	Z. marina ST	Flaveria ST	Rat Dopa/tyrosine ST
Quercetin	60-100	0.27	
P-nitrophenol	0.3		125

Figure 11

Primer Names	Primer sequences (From 5' to 3')	Corresponding conserved Protein Sequences
5' primers:		
Z-ADH-P1	GTIGCITGGGARSCIGGIAARCC	VAWEA(P)GKP
Z-CH-P1	CARRAIATGGTITTYACIGTITAYGG	QD(K)MVFTVYG
Z-PAL-P1	AARCAYCAYCCIGGICARATIGARGC	KHHPGQIEA
3'primers:		
Z-ADH-P5	TTRTARTTICCRAARAAIGTICCYTT	KGTFFGNYK
Z-CH-P4	GGIARIGCIARDATDATICCGIIRCA	CPGIILALP
Z-PAL-P4	YTCIACYTCYTTIGGIARIACIGC	AVLPKEVE

Figure 12

Gene Name	Size of the genes	Size of the partial clone	Strain File Designation
Alcohol dehydrogenase (ADH)	~1300 bp	938 bp	S19
Cinnamate 4-hydroxylase (CH)	~1500 bp	1083 bp	S20
Phenylalanine ammonia lyase (PAL)	~2000 bp	910 bp	S21
Peroxidase (POX)	~950 bp	590 bp	S2

Figure 13

GTGGCGTGGGAACCGGGGAAACCATTGGTTATGGAGGAAGTTGACGTGCGACCACCGCAGAAAGATGAGGTTCTGTGTCAGATCAAGTTC 90
 V A W E P G K P L V N E E V D V A P P Q K D E V R V K I K F
 ACGGCACTCTGTACACCGATGTCTTTTGGGAAGCCAAAGGGCCAAACGCCGGTGTTCCTCTGATCTTCGGTCACGAGGCCGGAGGG 180
 T A L C H T D V F F W E A K G Q T P V F P R I F G H E A G G
 ATTGTGGAAGTGTGGGGGAAGGCGTGACCGACGTGCTGCCGGGAGATCAGTCTCCAGTTTTCTACTGGGGAATGTAAAGAATGCCGC 270
 I V E S V G E G V T D V V P G D H V L P V F T G E C K E C R
 CACTGCAAAATCAGAAGAGAGTAATATGTGCGATCTCTTGAATAAACACCGATCGGGGTGTCATGCTGCTGATGGAATACTAGATTCT 360
 H C K S E E S N M C D L L R I N T D R G V M L A D G K S R F
 TCCATCAAAGGCAAAACCAATCTACCATTTTGTGCGAACCTCCACTTTTCAGTGAATACACTATTGTGCATGTTGGTTGTTTGGCTAAGATC 450
 S I K G K P I Y H F V G T S T F S E Y T I V H V G C L A K I
 AACCTGAAGCACCTCTTGACAAAGTTTGCACTCTTAGCTGTGGAATTTCCACCGGATTTGGCGCGACGGTTAATGTGGCAAAGCCGACC 540
 N P E A P L D K V C I L S C G I S T G F G A T V N V A K P T
 AAAGGTTCTTCCGTCGCCGTCTTCGGCCTGGGAGCCGTGGGTCTTTCTGCTTGTGAAGGAGCGAGGGTTTCTGGAGCGGCAGAAATAATC 630
 K G S S V A V F G L G A V G L S A C E G A R V S G A A R I I
 GGTATCGACATCAATCCTGATAGATTGAAGAAGCTAGGAAATTCGGGTGCACTGATTTTGTGAATCCAAAGGAACACACCAAACCTGTT 720
 G I D I N P D R F E E A R K F G C T D F V N P K E H T K P V
 CAAGAGGTTATTGCTGAAATGACCGACGGTGGAGTAGATCGTTGTTTGGAAATGTAAGGTAACATCAACGCCATGATTCTGCATTGAA 810
 Q E V I A E M T D G G V D R C L E C T G N I N A M I S A F E
 TCGCTCATGATGGATGGGGTGTGGCTGTTCTGGTGGGAGTTCTCAGAAAGATGCAGTTTTCAAGACTCACCACTGCAATTTCTGAGT 900
 C V H D G W G V A V L V G V P Q K D A V F K T H P L Q F L S
 GAAAAAACACTCAAGGGCACCTTACTTCGGCAACTATAA 939
 E K T L K G T L L R Q L .

0964422.0kb.1

Figure 14

Z. Marina V - - - - - AWE DGKPLVM EEVDVAPPQKD EVRVKIKFTALCHTDVFFW 41
Arabidopsis M S T T G Q I I R C - - - - - K A A V A W E A G K P L V I E E V E V A P P Q K H E V R I K I L F T S L C H T D L Y F W 54
Corn M A T A G K V I I K C - - - - - K A A V A W E A G K P L S I E B V E V A P P Q A M E V R V K I L F T S L C H T D V Y F W 54
E. Coli M K S - - - - - R A A V A F A P G K P L E I L V E I D V A P P K K G E V L I R V T H T G V C H T D A F T L 47

Z. Marina E A K G Q T P V F P R I F G H E A G G I V E S V G E G V T D V V P G D H V L P V F T G B C K E C R H C K S E E S N M C D 101
Arabidopsis E A K G Q T P L F P R I F G H E A G G I E S V G E G V T D L Q P G D H V L P I F T G E C G E C R H C S E E S N M C D 114
Corn E A K G Q T P V F P R I F G H E A G G I E S V G E G V T D V A P G D H V L P V F T G B C K E C A H C K S A E S N M C D 114
E. Coli S G D D P E G V F F V V L G H E G A G V V V E V G E G V T S V K P G D H V I P L Y T A B C G E C E F C R S G K T N L C V 107

Z. Marina L L R I N T D R G V M L A D G K S R F S I K G K P I Y H F V G T S T F S E Y T I V H V G C L A K I N P E A P L D K V C I 161
Arabidopsis L L R I N T E R G G M I H D G E S R F S I N G K P I Y H F L G T S T F S E Y T V V H S G Q V A K I N P D A P L D K V C I 174
Corn L L R I N T D R G V M I G D G K S R F S I N G K P I Y H F V G T S T F S E Y T V M H V G C V A K I N P Q A P L D K V C V 174
E. Coli A V R E T Q G K G - L M P D G T T R F S Y N G Q P L Y H Y M G C S T F S E Y T V V A E V S L A K I N P E A N H E H V C L 166

Z. Marina L S C G I S T G F G A T I N V A K P T K G S S V A F V G L G A V L S A C E G A R V S G A A R I I G I D I N P D R F E E 221
Arabidopsis V S C G L S T G L G A T L N V A K P K K G Q S V A I F G L G A V L G A A E G A R I A G A S R I I G V D F N S K R F D Q 234
Corn L S C G I S T G L G A S I N V A K P P K G S T V A V F G L G A V L A A A E G A R I A G A S R I I G V D L N P S R F E E 234
E. Coli L G C G V T T G I G A V H N T A K V Q P G D S V A V F G L G A I G L A V V Q G A R Q A K A G R I I A I D T N P K K F D L 226

Z. Marina A R K F G C T D F V N P K E H T K P V Q E V I A E M T D G G V D R C L E C T G N I N A M I S A F E C V H D G W G V A V L 281
Arabidopsis A K E F G V T E C V N P K D H K P I Q Q V I A E M T D G G V D R S V E C T G S V Q A M I Q A F C V H D G W G V A V L 294
Corn A R K F G C T E F V N P K D H K P V Q E V L A E M T N G G V D R S V E C T G N I N A M I Q A F C V H D G W G V A V L 294
E. Coli A R R F G A T D C I N P N D Y D K P I K D V L D I N K W G I D H T F E C I G N V N V M R A A L E S A H R G W G Q S V I 286

Z. Marina V G V P Q K D A V F K T H P L Q F L S E K T L K G T - - - - - L - - - - - 308
Arabidopsis V G V P S K D D A F K T H P M N F L N E R T L K G T F F G N Y K P K T D I P G V V E K Y M N K E L E L E K F I T H T V P 354
Corn V G V P H K D A E F K T H P M N F L N E R T L K G T F F G N Y K P R T D L P N V V E L Y M K K E L E V E K F I T H S V P 354
E. Coli I G V A V A G Q E I S T R E F Q L V T G R V W K G S A P G G V K G R S Q L P G M V E D A M K G D I D L E P F V T H T M S 346

Z. Marina L R Q L - - - - - 313
Arabidopsis F S E I N K A F D Y M L K G E S I R C I - - - I T M G A 379
Corn F A E I N K A F N L M A K G E G I R C I - - - I R M E N 379
E. Coli I D E I N D A F D L M H E G K S I R T V - - - I R - - Y 369

Parameter	Unit	Value
Mean	mm	1.0
Standard deviation	mm	0.2
Minimum	mm	0.5
Maximum	mm	1.5
Range	mm	1.0
Median	mm	1.0
Mode	mm	1.0
Skewness		0.0
Kurtosis		0.0
Correlation coefficient		1.0
Chi-square		0.0
Degrees of freedom		1
P-value		1.0
Significance level		0.05
Confidence interval		0.95
Power		0.80
Effect size		0.10
Sample size		100
Population size		1000
Response rate		0.90
Non-response rate		0.10
Dropout rate		0.05
Attrition rate		0.05
Retention rate		0.95
Completion rate		0.90
Follow-up rate		0.85
Adherence rate		0.80
Compliance rate		0.75
Participation rate		0.70
Engagement rate		0.65
Interest rate		0.60
Motivation rate		0.55
Effort rate		0.50
Performance rate		0.45
Productivity rate		0.40
Quality rate		0.35
Quantity rate		0.30
Value rate		0.25
Cost rate		0.20
Benefit rate		0.15
Risk rate		0.10
Uncertainty rate		0.05
Stability rate		0.00

\overline{GGCC} 1085
 G P

Figure 16

Z. Marina	-----0
Citrus	M D L N G W C N S G N Q N M C C C Q S Y ----- V K R G Y D R V L ----- S F N G L I T V S K L R G K R F K L 47
Kidney bean	M ----- T K L L ----- H S Y F S I P F S P F Y V S I P I A T V L F V L I I Y N F F L A S K N H S S ----- T 44
Z. Marina	-----0
Citrus	P P G P L P V P V F G N W L Q V G D D L N H R N L S D L A K K Y G D V L L L R M G Q R N L V V V S S P D H A K E V L H T 107
Kidney bean	P P G P L S V E I F G N W L K V G N D L N H R V I T S M S Q T Y G P V F L L K L G S K N L V V V S D P E L A T Q V L H S 104
Z. Marina	-----39
Citrus	Q G V E F G S E T R N V V F D I F T G K G Q D M V F T V Y G E H W R K M R R I M T V P F F T N K V V Q Q Y R F G W E D E 167
Kidney bean	Q G V E F G S R P F R N V V F D I F T G K G Q K M V F T V Y G E H W R T M R T I M N L P F F T K K G V H N Y S T M W E E 164
Z. Marina	-----99
Citrus	T K R V V E D L E A N F K A A T E G I V L R R L Q L M M Y N N L Y R I M F D R R F E S E D D P L F L K L K A L N G E R 227
Kidney bean	A A R V V E D V K K D P E A A T N G I V L R R L Q L M M Y N N M Y R I M F D R R F E S Q D D P L F N R L K A L N G E R 224
Z. Marina	-----159
Citrus	S K L A Q S F D Y N Y G D F I P I L R P F L K G Y L K K C Q E L K D N R I K L F K D Y F V D E R R K L L G S M T S K S E 287
Kidney bean	S R L A Q S F E Y N Y G D F I P I L R P F L R G Y L K I C K E V K E R R L Q L F K D Y F V E E R K K L A S T K S M S N E 283
Z. Marina	-----219
Citrus	Q Q K C A I D H I L E A E K K G E I N E D N V L Y I V E N I N V A A I E T T L W S V E W G V A E L V N H P E I Q K K L R 347
Kidney bean	S L K C A I D H I L D A Q T K G E I N E D N V L Y I V E N I N V A A I E T T L W S I E W G I A E L V N H P E I Q K K L R 343
Z. Marina	-----279
Citrus	H E L D T V L G P G V Q V T E P D T A K L P Y L Q A V I K E T L R L R M A I P L L V P H M N L H D A K L G S Y D I P A E 407
Kidney bean	N E L D T V L G P G H C I T E P D T H K L P Y L Q A V I K E T L R L R M A I P L L V P H M N L H D A K L G G V D V P A E 402
Z. Marina	-----336
Citrus	S K I L V N A W F L A N N P E K W K N P E E F R P E R F M E E S K V E A S G N --- D F R Y L P F G T G R R S C P G I 464
Kidney bean	S K I L V N A W L A N N P A Q W K K P E E F R P E R F L E E S K V E A N G N --- D F R Y L P F G V G R R S C P G I 462
Z. Marina	-----361
Citrus	I F A L P R ----- A N S A D I H H T G G A S S M H L ----- E G 519
Kidney bean	I L A L P I L G I T I G R L V Q N F E L L P P E G Q S K I D T A E K G G Q F S L H I L K H S T I V A K P R S F 510
Z. Marina	-----361
Citrus	I L A L P I L G L V I A K M V S N F E L - S A P Q G T K I I V N E K G G Q F S L H I ----- A N Y S T V L 517
Kidney bean	F H P I R T Q

09541224567

CAAGGAGGTCGA 912
K E V E

Figure 18

Z. Marina	MDQIEAMLCGGGEKTKVAVT--TKTLADPLNWGLAADQMKGSHLDEVKKMVEEYRPPVVN	0
Arabidopsis	M-----ACAWRSRSRADPLNWGLAAEELS GSHLEAVKRMVEEYRKPVVV	58
Wheat		44
Z. Marina	LGGETLTIGQVAAISTVGGSVKVELAETSRAGVKASSDWVME SMNKSTDSYGVTTGFGAT	118
Arabidopsis	MEGAT-TIAMVAAVAA--GSDTRVEIDESARGVKESSDWVMNSMMNGTDSYGVTTGFGAT	102
Wheat		
Z. Marina	SHRRTKNGTALQTELIRFLNAGIFGNTKETCHTLPQSATRAAMLVRVNTLLQGYSGIRFE	178
Arabidopsis	SHRRTKEGGALQRELIRFLNAGAFGTGTG-HVLPAAATRAAMLVRVNTLLQGYSGIRFE	161
Wheat		
Z. Marina	ILEAITSLLNHNISPSLPLRGTTITASGLVPLSYIAGLLTGRPN SKATGPDGESLTEKEA	238
Arabidopsis	ILETTATLLNANVTPCCLPLRGTTITASGLVPLSYIAGLLTGRPN SMATA PDGSKVNAAEA	221
Wheat		
Z. Marina	FEKAGISTGFEDLQPKEGALVNGTAVGSGMASMVLFEANVQAVLAEVLSAIFAEVMSGK	298
Arabidopsis	FKIAGIQHGFFELOPKEGLAMVNGTAVGSGLASMVLFEANVLSLLAEVLSGVFCEVMNGK	281
Wheat		
Z. Marina	PEFTDHLTHRLKHHHPGQIEAAAIMEHILDGSSYMKLAQKVHEMDPLQKPKQDRYALRTSP	358
Arabidopsis	PEFTDHLTHRLKHHHPGQIEAAAIMEHILEGSSYMMMLAKKLGELDPLMKPKQDRYALRTSP	341
Wheat		
Z. Marina	QWLGPQVEVIRASTKSIEREINSVNDNPLIDVSRNKALHGGNFQGTPIGVSMNTRLAIA	418
Arabidopsis	QWLGPQIEVIRQATKSIEREINSVNDNPLIDVSRNKALHGGNFQGTPIGVSMNTRLAIA	401
Wheat	QWLGPQIEVIRAAATKSIEREINSVNDNPLIDVSRNKALHGGNFQGTPIGVSMNTRLAIA	401
Z. Marina	AIGKLMFAQFSELVNDFYNNGLPSNLSGGRNP SLDYGFKGGEIAMASYCSELQFLANPVT	478
Arabidopsis	AIGKLMFAQFSELVNDFYNNGLPSNLTASSNP SLDYGFKGAEIAMASYCSELQFLANPVT	461
Wheat	AIGKLMFAQFSELVNDFYNNGLPSNLSGGRNP SLDYGFKGAEIAMASYCSELQFLGNPVT	461
Z. Marina	NHVQSAEQHNQDVNSLGLISARKTAESLEILKLMTSTFLVGICQAVDLRHLEENLRQT VK	538
Arabidopsis	NHVQSAEQHNQDVNSLGLISSRKTSBAVDILKLMSSTFLVGICQAVDLRHLEENLRQT VK	521
Wheat	NHVQSAEQHNQDVNSLGLISSRKTAEAIDILKLMSSTFLVALCOAIDLRHLEENLVNNAVK	521
Z. Marina	NTVSQVAKRVLTMTANGELHPSRFCEKDLLKVV DREYVFSYI DDPCSATYPLMQKLS VL	598
Arabidopsis	NTVSQVAKKVLTTGINGELHPSRFCEKDLLKVV DREYVFTYVDDPCSATYPLMQRLRQVI	581
Wheat	SCVKTVARKTISTDNNGHLENARFCEKDILITIDREAVFAYADDP CSANYPLMQKMRRAVL	581
Z. Marina	VDHALNNGDKKDEAMSI FOKTAVFEEELIAVFEPKEV	658
Arabidopsis	VDHALNNGETEKNAVTSIFOKI GAFEEELIKAVLPKEVEAARAAYGNGTAPIPNRIK ECRS	641
Wheat	VEHALANGFAFAHVE TSVFAKLAMFQEIRAVLPKEVEAARS AVE NGTAAQQNRIA ECRS	641
Z. Marina	YPLYRFVREELGTKL LTGEKVVSPGEEF DKKVETAMCEGKLIDPLMDCLKEWNGAFI EIC	717
Arabidopsis	YPLYRFVRKELGTEY LTGEKTRSPGEEF DKKVETAMNQGRHIDALLECLKEWNGEPL ELC	700
Wheat		

Figure 19

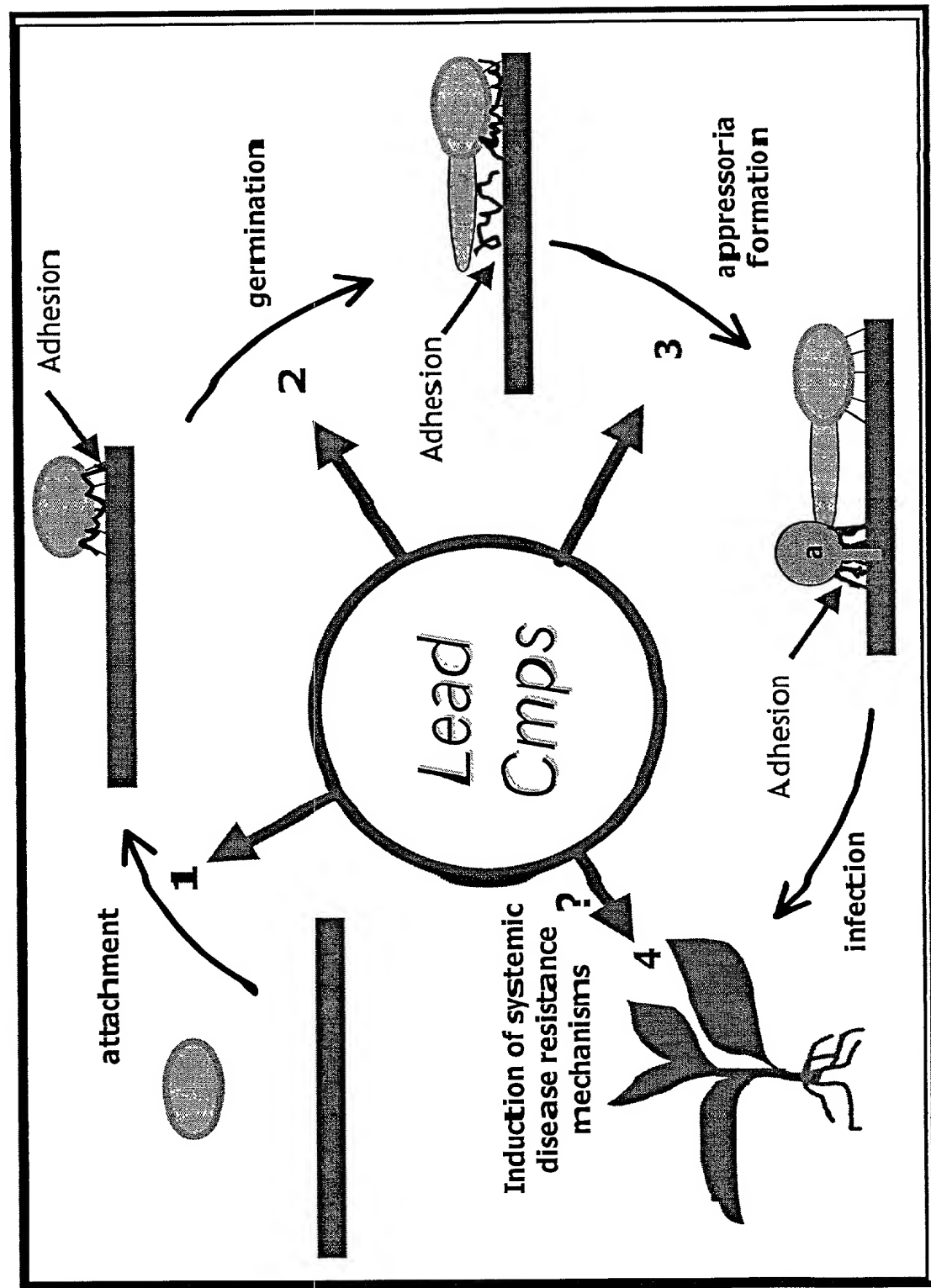


Figure 20

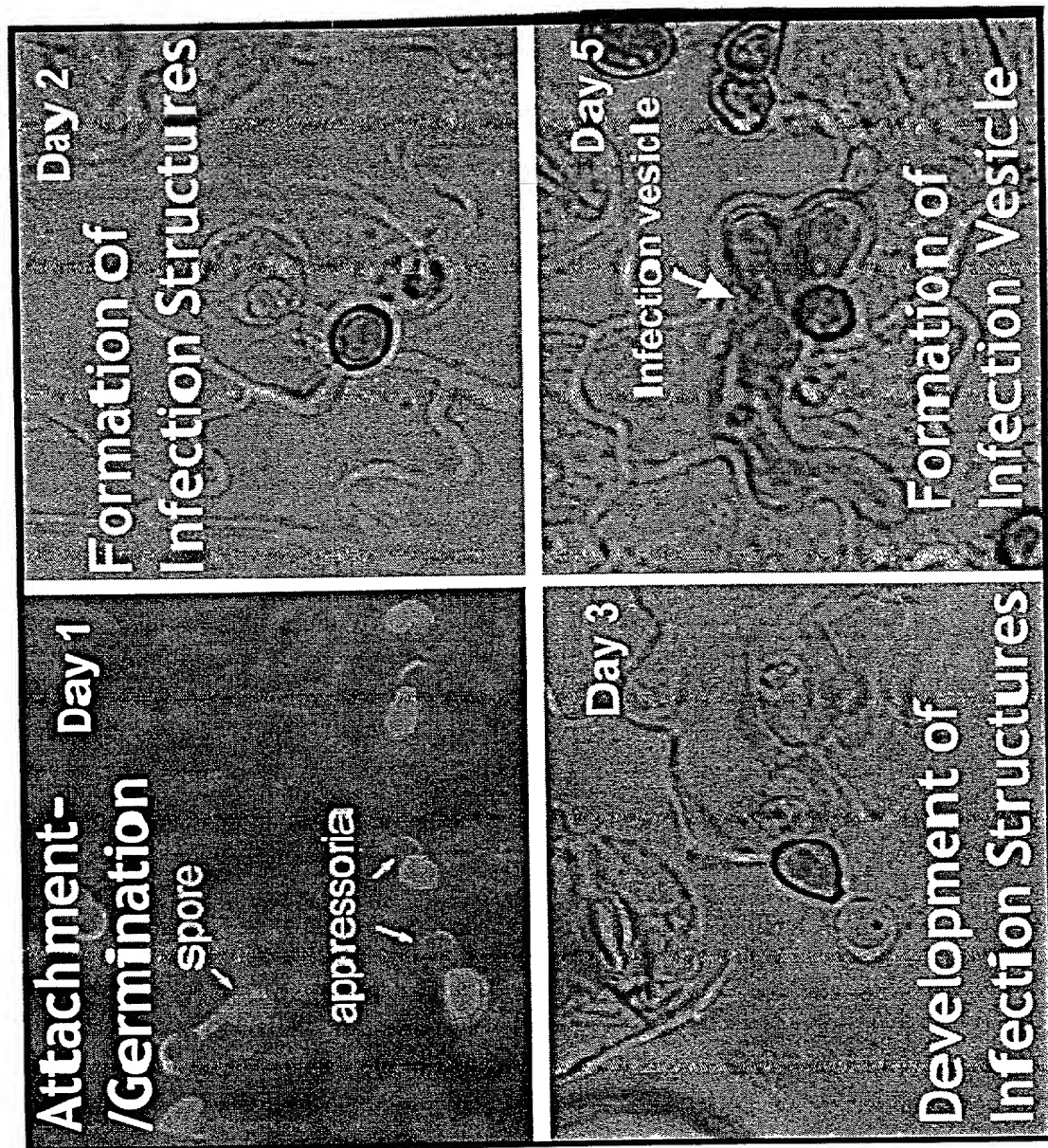


Figure 21A

	Disease	Fungus	Crops
Ascomycetes	Glume Blotch	<i>Septoria nodorum</i>	Cereals
	Leaf Spot	<i>Septoria tritici</i>	Cereals
	Powdery Mildew	<i>Erysiphe</i> spp.	Cereals Grapes
	Leaf Blotch	<i>Rhynchosporium secalis</i>	Cereals
	Stem Canker	<i>Leptosphaeria maculans</i>	Cereals
Basidiomycetes	Yellow Rust	<i>Puccinia striiformis</i>	Cereals
Oomycetes	Blue mold	<i>Peronospora tabacina</i>	Tobacco
	Eyespot	<i>Pseudocerospora herpotrich</i>	Cereals

Figure 21B

Taxa	Disease	Fungus	Plant Infection	In vitro adhesion	Plant adhesion
Ascomycetes	Rice Blast	<i>Magnaporthe grisea</i>	✓	✓	✓
	Brassica Dark Leaf Spot	<i>Alternaria brassicicola</i>	✓	✓	ongoing
	Bean Anthracnose	<i>Colletotrichum lindemuthianum</i>	✓	✓	✓
	Strawberry Anthracnose	<i>C. fragariae</i> <i>C. acutatum</i>	✓	✓	✓
	Avocado Anthracnose	<i>C. gleosporioides</i>	✓	Not Tested	Not Tested
	Green Mold	<i>Penicillium italicum/digitatum</i>	✓	Not Tested	Not Tested
	Apple Scab	<i>Venturia inaequalis</i>	✓	Not Tested	Not Tested
	Grey Mold	<i>Botrytis cinerea</i>	Not Tested	✓	Not Tested
	Leaf Spot	<i>Septoria tritici</i>	✓	Not Tested	Not Tested

Figure 22

	Disease	Fungus	Plant Infection	In vitro adhesion	In planta adhesion
Basidiomycetes	Wheat brown rust	<i>Puccinia recondita</i>	✓	✓	✓
Oomycetes Pythiaceae	Damping-off	<i>Pythium aphanidermatum</i>	✓	Ongoing	ongoing
	Potato late blight	<i>Phytophthora infestans</i>	✓	ongoing	ongoing
Peronosporaceae	Downy Mildew	<i>Peronospora parasitica</i>	ongoing	✓	ongoing

Figure 23

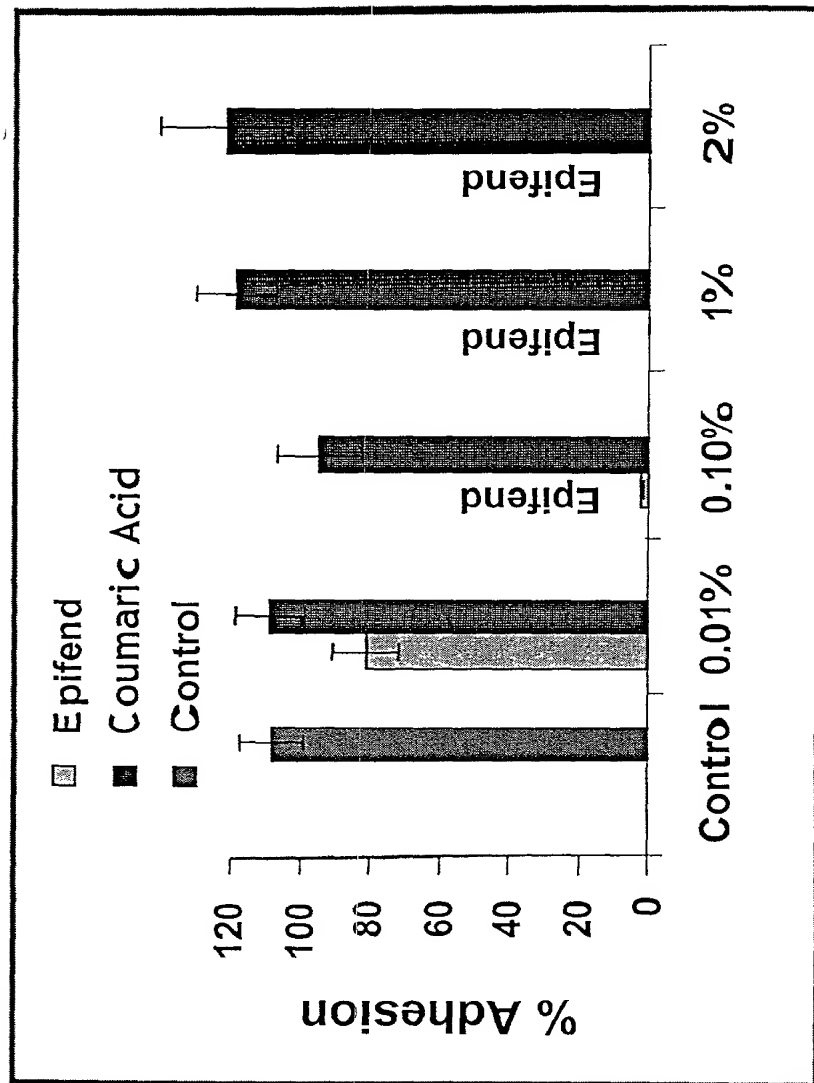


Figure 24

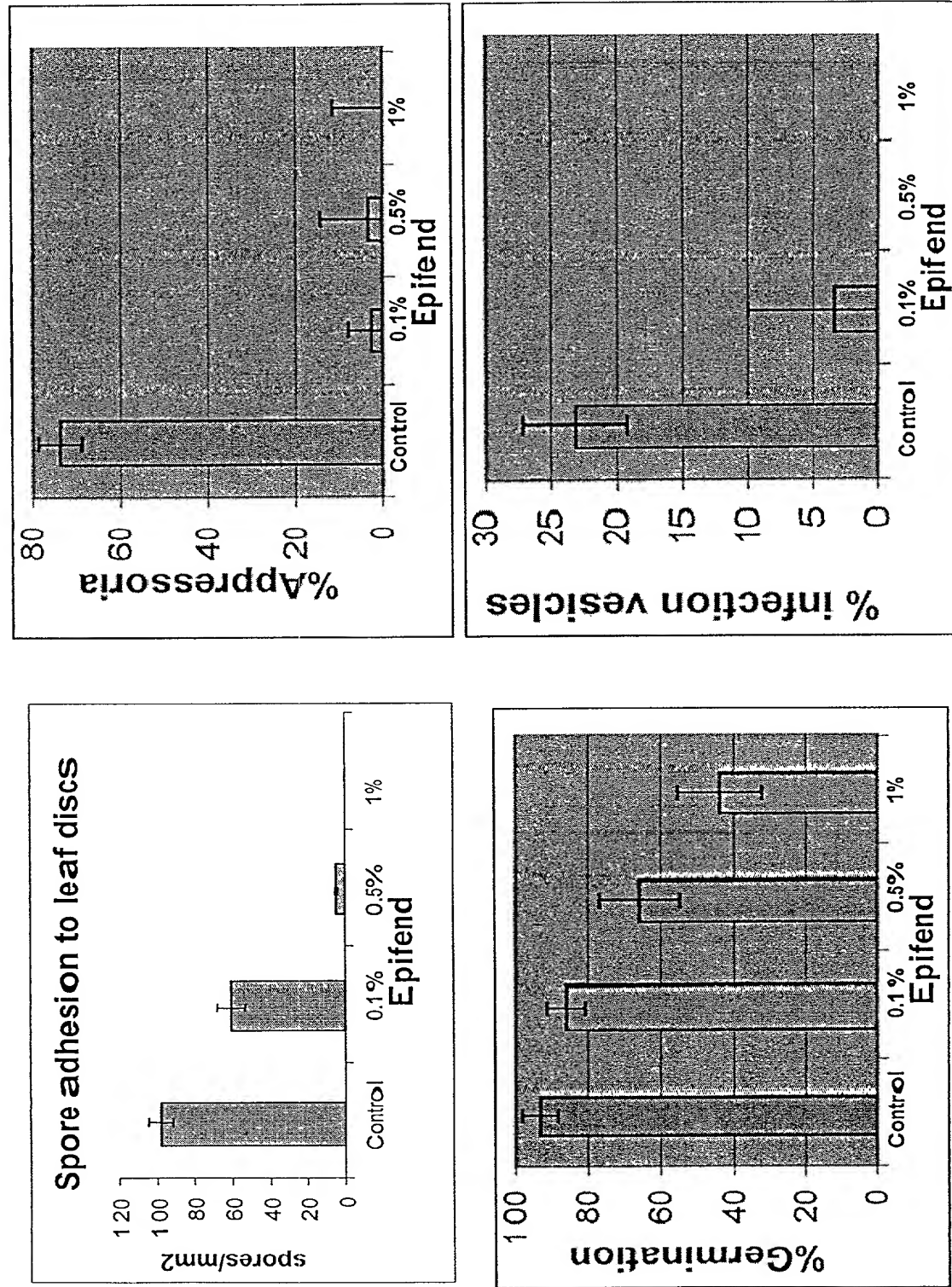


Figure 25

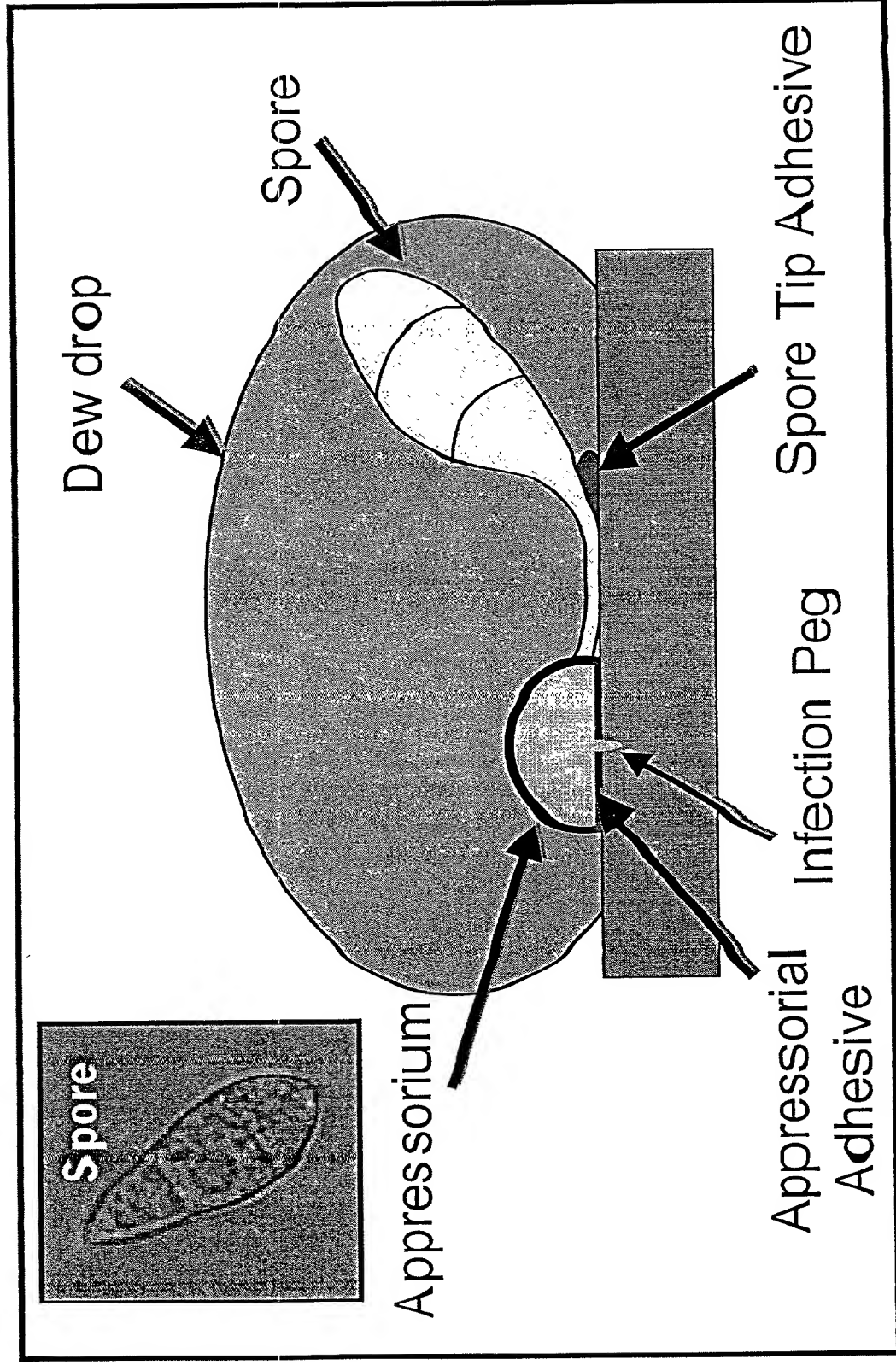


Figure 26

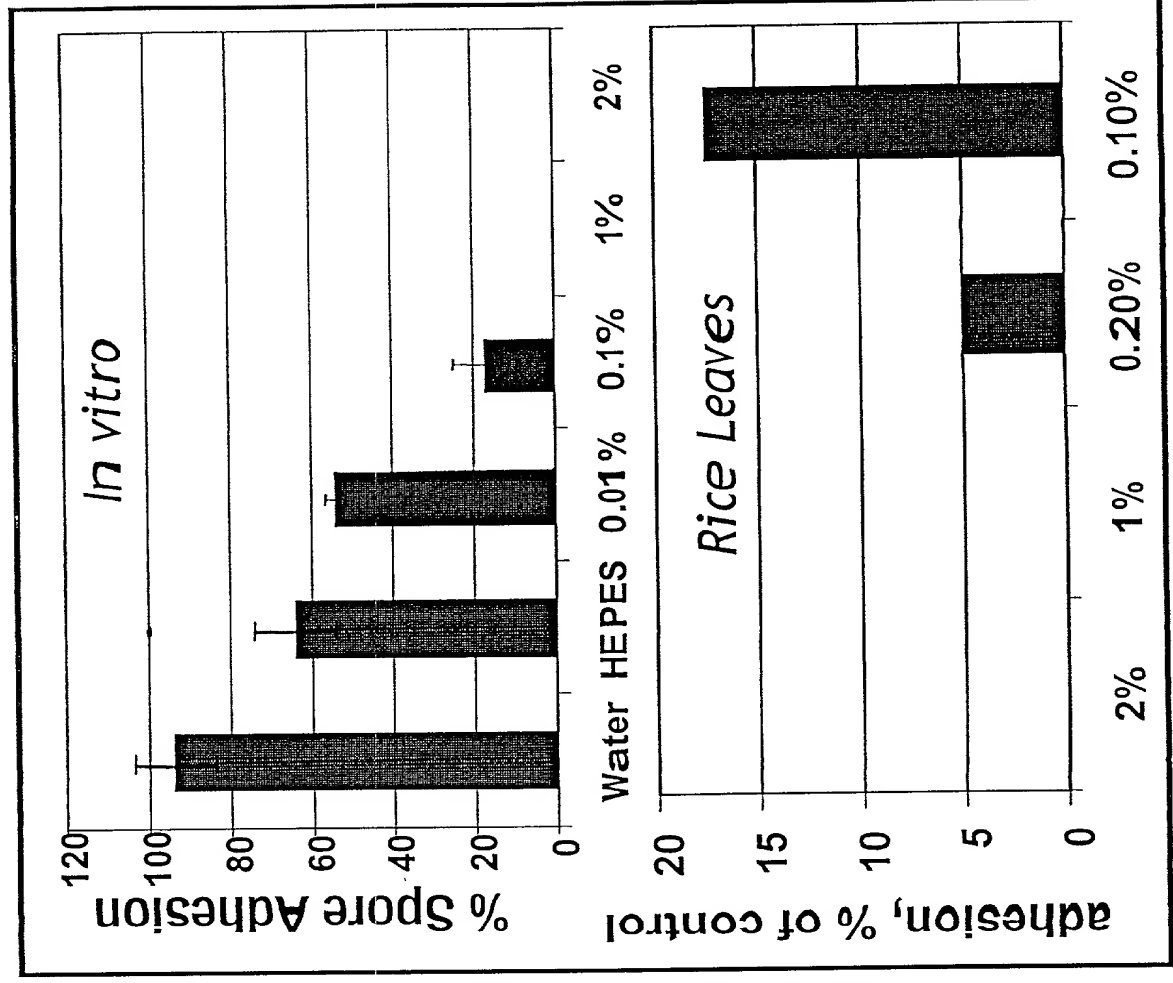
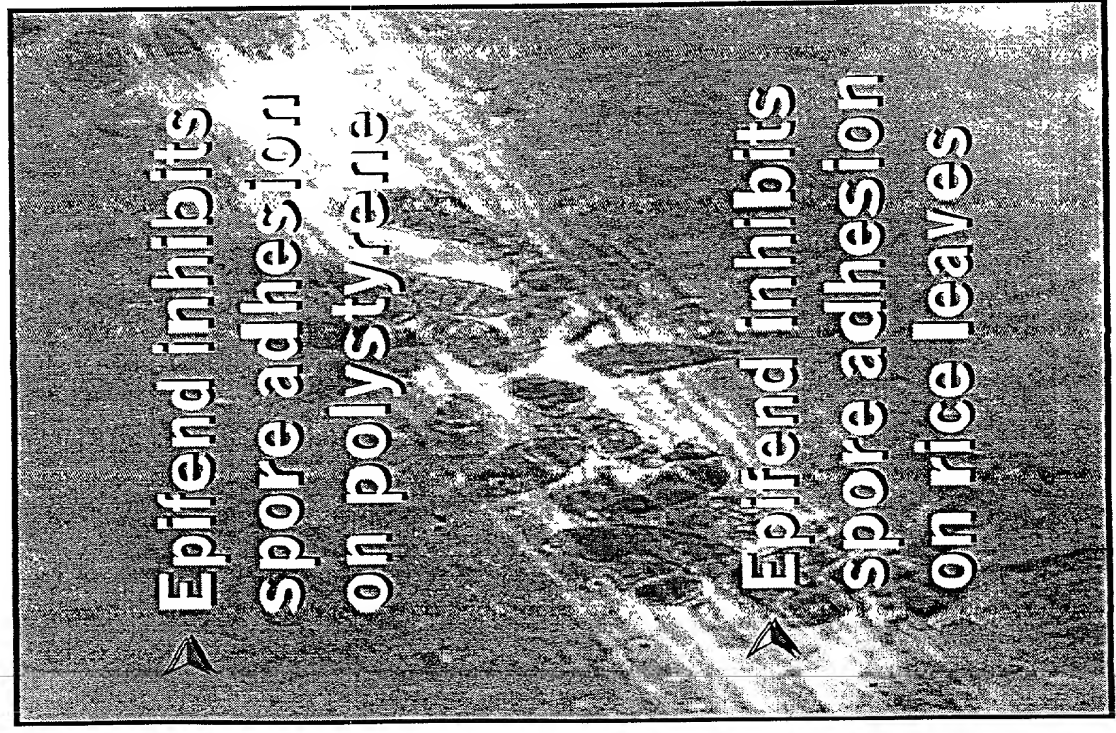


Figure 27

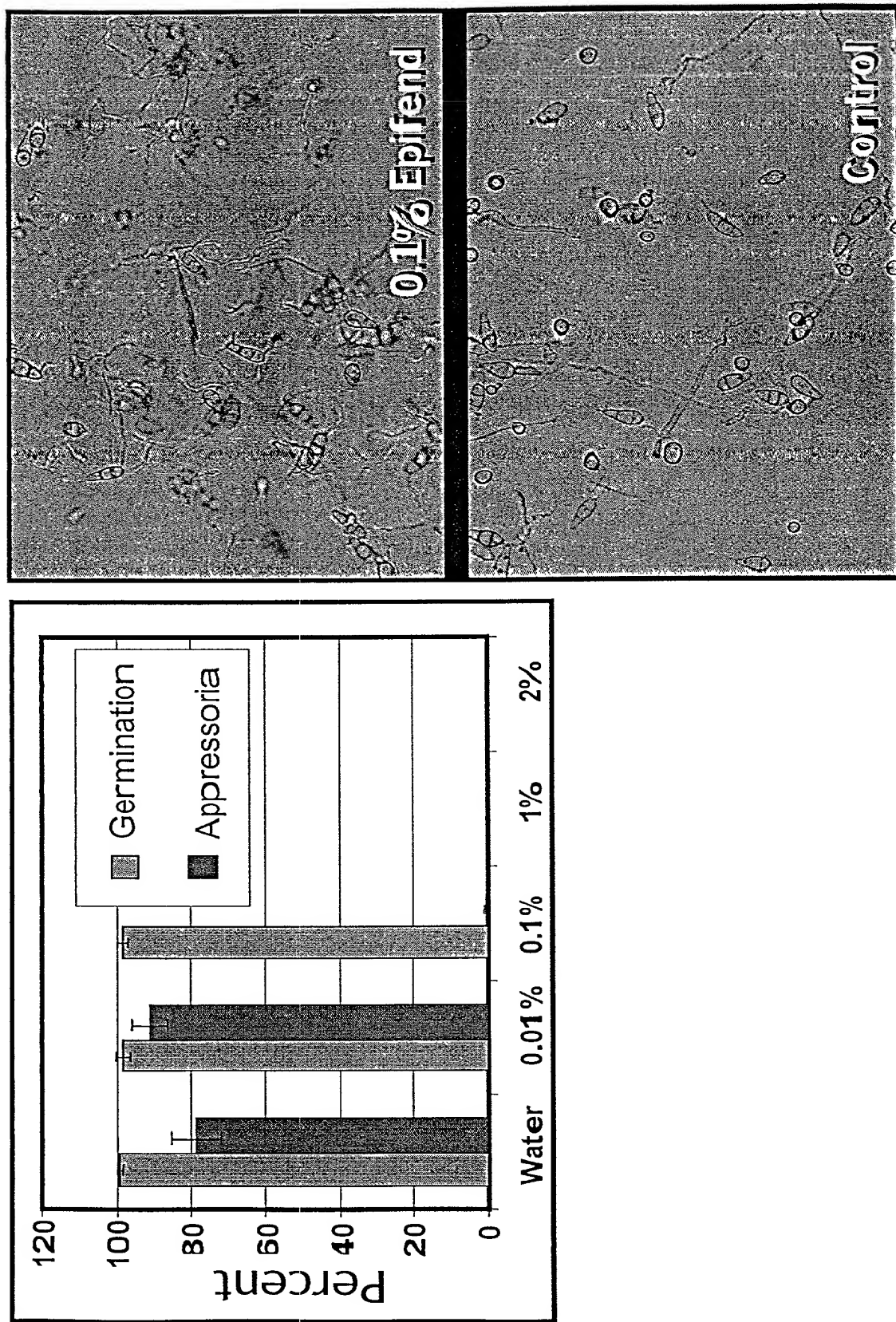


Figure 28

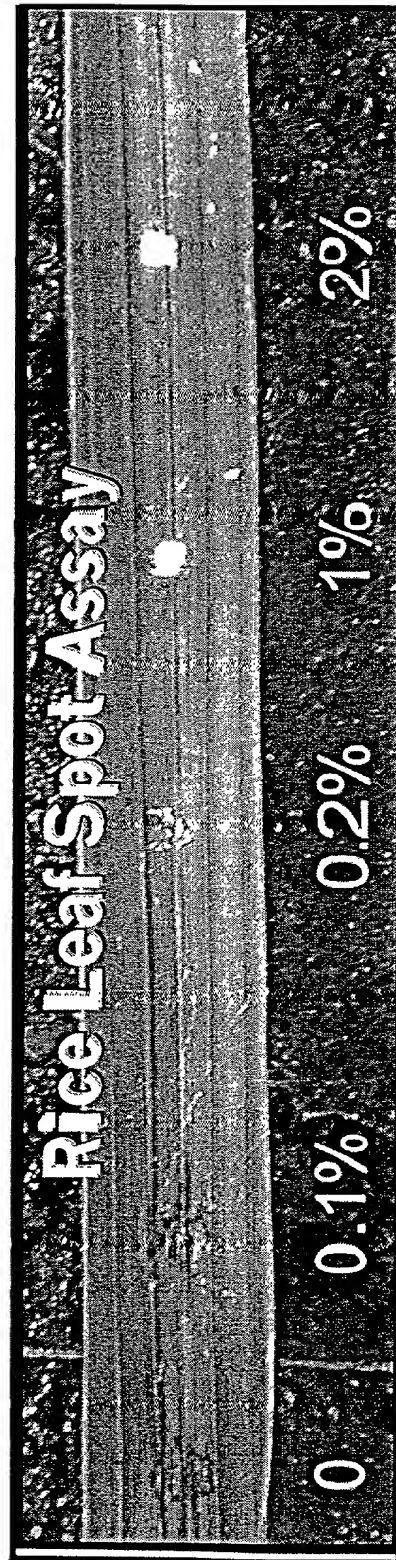
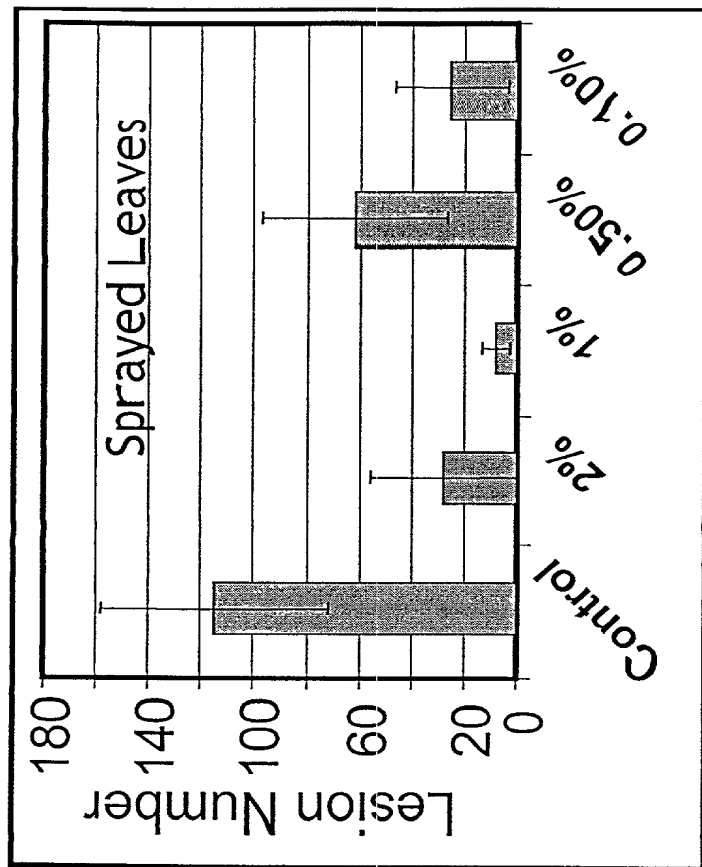
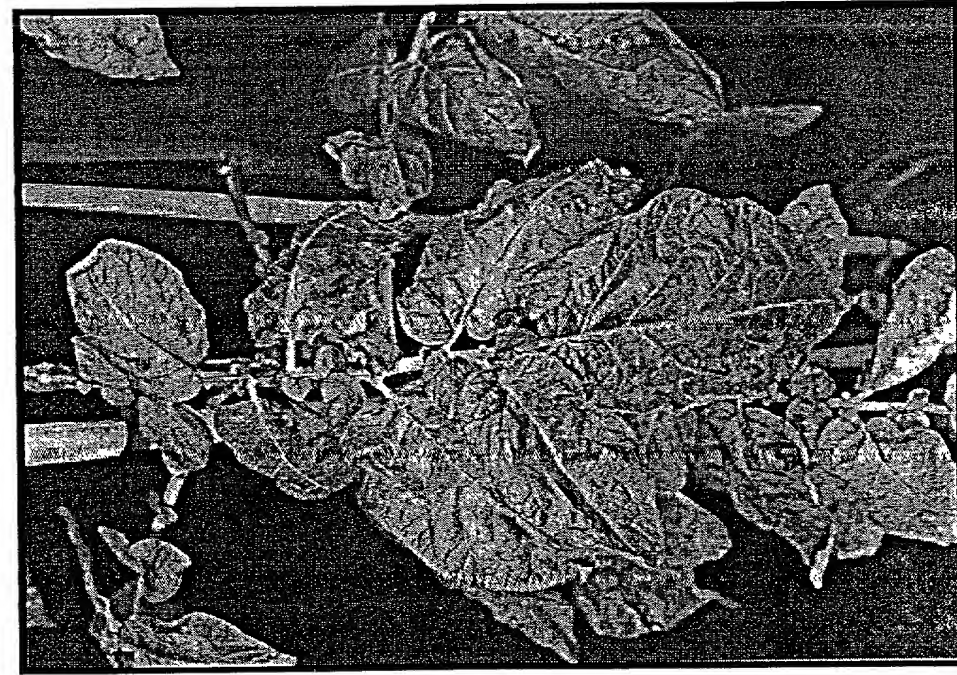


Figure 29

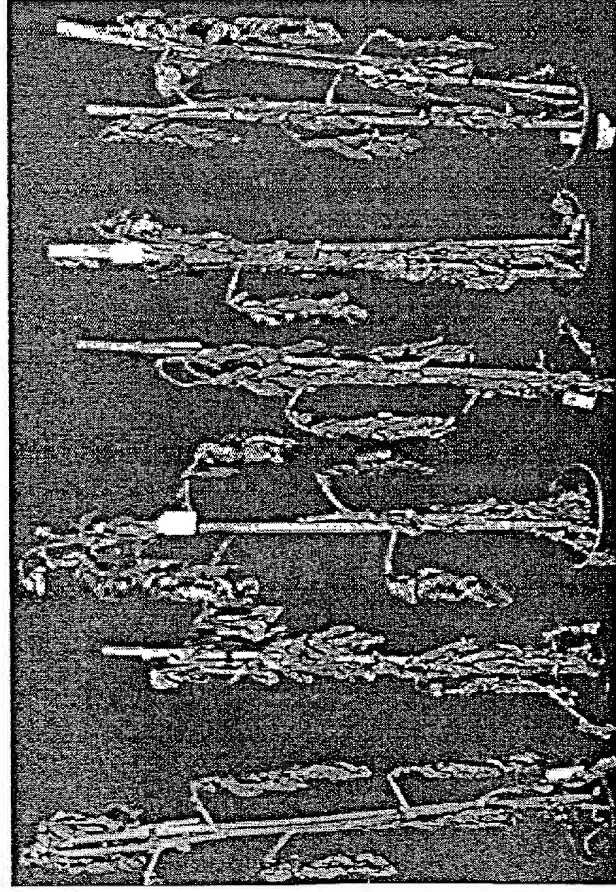


Control, 4 days



1% Epifend, 4 days

Figure 30



Control 11 days

1% Epifend 11 days

